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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO:	CONFIRMATION NO.
10/625,132	07/22/2003	Joseph M. Jeddeloh	501304.01	8276

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EXAMINER	
SORRELL, ERON J	

ART UNIT	PAPER NUMBER
2182	

DATE MAILED: 07/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/625,132	JEDDELOH, JOSEPH M.	
	Examiner	Art Unit	
	Eron J. Sorrell	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *3,10,19 and 30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9,11-18 and 20-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/28/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1,2,5,6,8,9,13,14,17,18,21,22,24,26,28,29,32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leddige et al. (U.S. Patent No. 6,477,614 hereinafter "Leddige" in view of Cheung (U.S. Pub No. 2004/0216018).

3. Referring to apparatus claims 1 and 8, and system claims 13 and 24, Leddige teaches a computer system, comprising:

a central processing unit ("CPU") (see item 101 in figure 1);

a system controller coupled to the CPU (see item 111 in figure 1), the system controller having an input port and an output port (see bi-directional interface connecting item 111 to bus 120);

an input device coupled to the CPU through the system controller (see item 123 in figure 1);

an output device coupled to the CPU through the system controller (see item 122 in figure 1);

a storage device coupled to the CPU through the system controller (see item 131 in figure 1)

a memory bus on which memory requests are provided (see item 300 in figure 3);

a plurality of memory devices (see items labeled "MEMORY DEVICE" in figure 3); and

a memory hub (see item 320 in figure 3) , comprising:

a link interface for receiving memory requests for access to at least one of the memory devices (see item 310 in figure 3);

a memory device interface coupled to the memory devices (see item 321 and 322 in figure 3), the memory device interface coupling memory requests to the memory devices for access to at least one of the memory devices (see paragraph bridging columns 3 and 4);

a switch for selectively coupling the link interface and the memory device interface (see lines 11-52 of column 8);

and a communications link coupled between the system controller and at least one of the plurality of memory modules for coupling memory requests and data between the system controller and the memory modules (see bus connecting item 111 to item 113 in figure 1).

Leddige fails to teach the hub further comprises a direct memory access (DMA) engine coupled through the switch to the memory device interface, the DMA engine generating memory requests for access to at least one of the memory devices to perform DMA operations.

Cheung teaches in an analogous system a DMA controller located on a memory module (see paragraph 11 on page 2), the DMA engine generating memory requests for access to at least one memory device to perform DMA operations (see paragraph 10 on page 1).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the memory module of Leddige with the above teachings of Cheung. One of ordinary skill would have been motivated to make such modification in order to provide testing and verification of components as suggested by Cheung (see paragraph 10 on page 1) in addition to relieving the memory

hub of burdensome data transfers freeing it to work on other tasks.

4. Referring to apparatus claims 2 and 9, and system claims 14 and 26, the combination of Leddige and Cheung teaches the memory hub is an embedded system having the link interface, the memory device interface, the switch, and the DMA engine residing in a single device (see figure 7 of Leddige and paragraph 11 on page 2 of Cheung).

5. Referring to apparatus claim 5 and system claims 21 and 32, Leddige teaches the plurality of memory devices is a bank of memory devices simultaneously accessed during a memory operation (see MEMORY DEVICES in figure 3 and paragraph bridging columns 3 and 4).

6. Referring to claim 6, and system claims 22 and 33, Leddige teaches the plurality of memory devices comprise synchronous dynamic random access memory devices (see lines 17-31 of column 2).

7. Referring to system claim 17 and 28, Leddige teaches a plurality of memory modules (see items 210a, 211a, and 212a

in figure 3) are included in the memory system and a first memory module (see item 210a) of the plurality of memory modules is coupled to the memory bus (note that memory bus 300 is only connected to module 310a) and the remaining memory modules of the plurality are coupled in series with the first memory module (see interfaces 311-314 in figure 3).

8. Referring to system claim 18 and 29, Leddige teaches a plurality of memory modules are included in the memory system and each of the plurality of memory modules are coupled directly to the memory bus through a respective link interface (see figure 5).

9. Claims 7,12,23, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leddige in view of Cheung as applied to claims 1,8,13, and 24 above, and further in view of Schmidt (U.S. Patent No. 6,782,465).

10. Referring to claims apparatus claim 7 and 12, and system claims 23 and 34, the combination of Leddige and Cheung teaches the DMA engine comprises (see Cheung figure 2):

an address register for storing a starting memory address for a DMA operation (see paragraph 16 on page 2);

a target address location for storing a target address of a location to which data is to be moved in the DMA operation (see paragraph 16 on page 2);

a count register for storing a count value indicative of the number of memory locations to be accessed in the DMA operation (see paragraph 16 on page 2).

The combination of Leddige and Cheung fails to teach the DMA controller further comprises a next register for storing a value representative of the completion of the DMA operation or representative of a memory address corresponding to a link list including a starting memory address, a count value and a next memory address to be loaded into the address register, the count register, and the next register.

Schmidt teaches a DMA controller comprising the above next register (see lines 5-18 of column 3).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Leddige and Schmidt with the above teachings of Schmidt in order to increase the rate of

memory transfers as suggested by Schmidt (se liens 7-10 of column 2).

11. Claims 4,11,20, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leddige and Cheung as applied to claims 1,8,13, and 24 above, and further in view of "Throughput Expansion with FET Based Crossbar Switching" (hereinafter Jones).

12. Referring to apparatus claims 4 and 11, and system claims 20 and 31, the combination of Leddige and Cheung fails to teach the switch is a crossbar switch.

Jones teaches a crossbar switch with "very low propagation delays…that can fit in any environment requiring greater bandwidth (see paragraph bridging pages 2 and 3)."

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Leddige and Cheung with the above teachings from Jones to increase throughput through the hub as suggested by Jones.

13. Claims 15,16,25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leddige in view of Cheung as applied to claims 1,8,13, and 24 above, and further in view of Frame et al. (US Pub. No. 2004/0243769 hereinafter "Frame").

14. Referring to claims 15,16,25, and 27, the combination of Leddige and Cheung fails to teach a communications link comprises a high-speed optical memory bus and wherein the link interface of the memory hub comprises an optical memory bus interface circuit for translating optical signals and electrical signals.

Frame teaches, in an analogous system, the above limitation (see paragraph 15 on page 2).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Leddige and Cheung with the above teachings of Frame in order to further increase bandwidth through the system.

Response to Arguments

15. The declaration filed on 4/28/06 under 37 CFR 1.131 has been considered but is ineffective to overcome the Cheung reference.

16. Upon careful review of the applicant's remarks, declaration, and corresponding exhibit, it appears as if the applicant is attempting to prove prior invention by showing conception of the invention prior to the effective date of the reference coupled with due diligence from prior to the reference date to the filing date of the application (constructive reduction to practice).

I. Conception

17. The evidence submitted is insufficient to establish a conception of the invention prior to the effective date of the Cheung reference. While conception is the mental part of the inventive act, it must be capable of proof, such as by demonstrative evidence or by a complete disclosure to another. Conception is more than a vague idea of how to solve a problem. The requisite means themselves and their

interaction must also be comprehended. See *Mergenthaler v. Scudder*, 1897 C.D. 724, 81 O.G. 1417 (D.C. Cir. 1897).

18. Per MPEP 715,

The essential thing to be shown under 37 CFR 1.131 is priority of invention and this may be done by any satisfactory evidence of the fact. **FACTS, not conclusions, must be alleged**. Evidence in the form of exhibits may accompany the affidavit or declaration. **Each exhibit relied upon should be specifically referred to in the affidavit or declaration, in terms of what it is relied upon to show.**

A general allegation that the invention was completed prior to the date of the reference is not sufficient. Ex parte Saunders, 1883 C.D. 23, 23 O.G. 1224 (Comm'r Pat. 1883). Similarly, a declaration by the inventor to the effect that his or her invention was conceived or reduced to practice prior to the reference date, **without a statement of facts demonstrating the correctness of this conclusion, is insufficient to satisfy 37 CFR 1.131.**

When reviewing a 37 CFR 1.131 affidavit or declaration, the examiner must consider all of the evidence presented in its entirety, including the affidavits or declarations and all accompanying exhibits, records and "notes." **An accompanying exhibit need not support all claimed limitations, provided that any missing limitation is supported by the declaration itself.** Ex parte Ovshinsky, 10 USPQ2d 1075 (Bd. Pat. App. & Inter. 1989).

19. The declaration and the corresponding exhibit do not provide enough evidence to support all the claimed limitations prior to the reference date, therefore does not support conception of the claimed invention.

Claim 5 requires that the bank of memory devices be simultaneously accessed during a memory operations. There

is no evidence in the declaration or exhibit to support this limitation.

Claim 7 requires the DMA engine to comprise various control registers. The evidence submitted only seems to suggest that control data is stored in main memory by the processor (not the DMA engine), then the DMA engine executes a series of commands then jumps to the next command. There is no evidence that the DMA engine has any internal storage.

Claims 15 and 16 require the memory bus to be a high-speed memory bus and a high-speed optical bus, respectively. There is no evidence in the declaration or exhibit to support these limitations.

The claims identified above are not intended to be a complete listing of claims in which evidence of conception is insufficient. The Examiner also notes that in section 3 of the declaration, the inventor only claims to have conceived at least claims 1,8,13, and 24 before the reference date, leaving conception of the other pending claims in question.

II. Diligence

Per MPEP 715.07(a),

In determining the sufficiency of a 37 CFR 1.131 affidavit or declaration, **diligence need not be considered unless conception of the invention prior to the effective date is clearly established**, since diligence comes into question only after prior conception is established. Ex parte Kantor, 177 USPQ 455 (Bd. App. 1958).

20. The applicant has not yet met the requirements for showing conception, however in the interest of compact prosecution, the Examiner will consider the declaration and the accompanying exhibit to determine if the applicant has shown due diligence from prior to the reference date to the filing date of the application.

21. Per MPEP 2138.06,

THE ENTIRE PERIOD DURING WHICH DILIGENCE IS REQUIRED MUST BE ACCOUNTED FOR BY EITHER AFFIRMATIVE ACTS OR ACCEPTABLE EXCUSES

An applicant must account for the entire period during which diligence is required. Gould v. Schawlow, 363 F.2d 908, 919, 150 USPQ 634, 643 (CCPA 1966) (Merely stating that there were no weeks or months that the invention was not worked on is not enough.); In re Harry, 333 F.2d 920, 923, 142 USPQ 164, 166 (CCPA 1964) **(statement that the subject matter "was diligently reduced to practice" is not a showing but a mere pleading). A 2-day period lacking activity has been held to be fatal.** In re Mulder, 716 F.2d 1542, 1545, 219 USPQ 189, 193 (Fed. Cir. 1983) (37 CFR 1.131 issue); Fitzgerald v. Arbib, 268 F.2d 763, 766, 122 USPQ 530, 532 (CCPA 1959) (Less than 1 month of inactivity during critical period. Efforts to exploit an invention commercially do not constitute diligence in reducing it to practice. An actual reduction to practice in the case of a design for a three-dimensional article requires that it

should be embodied in some structure other than a mere drawing.); Kendall v. Searles, 173 F.2d 986, 993, 81 USPQ 363, 369 (CCPA 1949) (**Diligence requires that applicants must be specific as to dates and facts.**).

The period during which diligence is required must be accounted for by either affirmative acts or acceptable excuses. Rebstock v. Flouret, 191 USPQ 342, 345 (Bd. Pat. Inter. 1975); Rieser v. Williams, 225 F.2d 419, 423, 118 USPQ 96, 100 (CCPA 1958) (Being last to reduce to practice, party cannot prevail unless he has shown that he was first to conceive and that he exercised reasonable diligence during the critical period from just prior to opponent's entry into the field); Griffith v. Kanamaru, 816 F.2d 624, 2 USPQ2d 1361 (Fed. Cir. 1987) (**Court generally reviewed cases on excuses for inactivity including vacation extended by ill health and daily job demands, and held lack of university funding and personnel are not acceptable excuses.**); Litchfield v. Eigen, 535 F.2d 72, 190 USPQ 113 (CCPA 1976) (budgetary limits and availability of animals for testing not sufficiently described); Morway v. Bondi, 203 F.2d 741, 749, 97 USPQ 318, 323 (CCPA 1953) (voluntarily laying aside inventive concept in pursuit of other projects is generally not an acceptable excuse although there may be circumstances creating exceptions); Anderson v. Crowther, 152 USPQ 504, 512 (Bd. Pat. Inter. 1965) (preparation of routine periodic reports covering all accomplishments of the laboratory insufficient to show diligence); Wu v. Jucker, 167 USPQ 467, 472-73 (Bd. Pat. Inter. 1968) (applicant improperly allowed test data sheets to accumulate to a sufficient amount to justify interfering with equipment then in use on another project); Tucker v. Natta, 171 USPQ 494,498 (Bd. Pat. Inter. 1971) ("[a]ctivity directed toward the reduction to practice of a genus does not establish, prima facie, diligence toward the reduction to practice of a species embraced by said genus"); Justus v. Appenzeller, 177 USPQ 332, 340-1 (Bd. Pat. Inter. 1971) (Although it is possible that patentee could have reduced the invention to practice in a shorter time by relying on stock items rather than by designing a particular piece of hardware, patentee exercised reasonable diligence to secure the required hardware to actually reduce the invention to practice. "[I]n deciding the question of diligence it is immaterial that the inventor may not have taken the expeditious course….").

The diligence of attorney in preparing and filing patent application inures to the benefit of the inventor. Conception was established at least as early as the date a draft of a patent application was finished by a patent attorney on behalf of the inventor. Conception is less a matter of signature than it is one of disclosure. Attorney does not prepare a patent application on behalf of particular named persons, but on behalf of the true inventive entity. Six days to execute and file application is acceptable. Haskell v. Coleburne, 671 F.2d 1362, 213 USPQ 192, 195 (CCPA 1982). See also Bey v. Kollonitsch, 866 F.2d 1024, 231 USPQ 967 (Fed. Cir. 1986). (Reasonable diligence is all that is required of the attorney. Reasonable diligence is established if attorney worked reasonably hard on the application during the continuous critical period. If the attorney has a reasonable backlog of unrelated cases which he takes up in chronological order and carries out expeditiously, that is sufficient. Work on a related case(s) that contributed substantially to the ultimate preparation of an application can be credited as diligence.).

The evidence submitted is insufficient to establish diligence from a date prior to the date of reduction to practice of the Cheung reference (April 28, 2003) to the US filing date of this application (July 22, 2003) because in section 8 of the declaration, the applicant makes a blanket statement that from a time prior to April 28, 2003 to when the application was filed, the inventor worked with the attorney to prepare and finalize the patent application. The applicant has not been specific as to dates and facts during this period (a 2-day period lacking activity has been held fatal). Since section 8 does not cover all the

specifics as to dates and facts, section 8 is insufficient to establish diligence between April 28, 2003 and July 22, 2003.

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eron J. Sorrell whose telephone number is 571 272-4160. The

examiner can normally be reached on Monday-Friday 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Huynh can be reached on 571-272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EJS
June 28, 2006

KIM HUYNH
SUPERVISORY PATENT EXAMINER
6/29/06